

A REVIEW OF THE LEAFHOPPER GENUS *COFANA*  
(HOMOPTERA: CICADELLIDAE)<sup>1</sup>

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**Abstract.**—The Old World genus *Cofana* is redescribed. A list of species with synonyms and distributions includes 10 new combinations, 8 new synonyms and the following 9 new species: *hoogstraali*, *jedarfa*, *lata*, *maai*, *medleri*, *polaris*, *separata*, *sotoi* and *yasumatsui*. A key to 17 of the 19 known species and illustrations of many of the key characters are included.

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The genus *Cofana* is part of the leafhopper tribe Cicadellini, of the Old World, that is under study by the author. Because of requests for identifications, often involving unpublished synonymy, new combinations, and undescribed species, it is considered advisable to present this review before the remainder of the work. Coded bibliographic references to works before 1956 (e.g., Kirkaldy 1905b:319) may be found in the Metcalf (1964) work cited in the Literature Cited section in this paper, the number after the colon referring to the page.

Institutional abbreviations used in the text are as follows: AMNH, American Museum of Natural History; BM, British Museum; BPBM, Bernice P. Bishop Museum; CAS, California Academy of Sciences; HNHM, Hungarian Natural History Museum; MHNP, Museum National d'Histoire Naturelle; MMB, Moravian Museum in Brno; NCS, North Carolina State University; RMS, Riksmuseet, Stockholm; USNM, United States National Museum; ZIL, Zoological Institute, Lund; ZIMH, Zoologisches Institut und Museum, Hamburg.

Genus *Cofana* Melichar

*Cofana* Melichar, 1926a:345. Type-species: *Tettigonia quinquenotata* Stål, which is a junior subjective synonym of *Tettigonia eburnea* Walker, by subsequent designation of China, 1938d:185.

*Yasumatsuus* Ishihara, 1971:18. Type-species: *Kolla mimica* Distant (mis-determined), by original designation and monotypy, which is *Cofana yasumatsui*, new species, described below. NEW SYNONYMY.

**Description.**—Length of male 5.3–11.8 mm, of female 5.3–13.0 mm.

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<sup>1</sup> Paper number 5665 of the Journal Series of the North Carolina Agricultural Experiment Station, Raleigh, North Carolina.

Head not strongly produced, median length of crown from  $\frac{4}{10}$  to slightly more than  $\frac{3}{4}$  interocular width, and from  $\frac{1}{4}$  to slightly more than  $\frac{6}{10}$  transocular width, anterior margin varying from narrowly (*eburnea* (Walker) and *sotoi*, new species) to broadly rounded in dorsal view; ocelli usually aligned with anterior eye angles, or slightly more posteriorly in most species (exception: female of *C. separata*, new species), each closer to adjacent anterior eye angle than to median line of crown (exceptions: the new species *minima* and *jedarfa* in which they are equidistant from adjacent anterior eye angle and median line); crown with or without a concavity across ocelli, disk not sculptured, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges not protuberant, in lateral view with anterior margins varying from rectilinear to convex or concave and from vertical to oblique; clypeus usually very broadly and slightly convex medially, or flattened medially (shallowly concave in *eburnea* (Walker)), granulate or not sculptured medially, muscle impressions distinct or not (varying interspecifically), transclypeal suture entire (usually) or interrupted medially; clypellus in profile continuing contour of clypeus or with its apical portion more nearly horizontal, without pubescence.

Thorax with pronotal width varying in comparison to transocular width of head, broader in most species (narrower in *eburnea*, *albida* (Walker), equal to width of head in *unimaculata* (Signoret), and variable within *jedarfa*, new species), pronotum with lateral margins convergent anteriorly, dorsopleural carinae almost always incomplete, posterior margin shallowly concave, posterior portion of disk transversely rugulose or not; scutellum occasionally transversely rugulose on posterior portion. Forewing usually hyaline and without a membrane (exception: *subvirescens* (Stål) which is coriaceous except for apical membrane), veins usually distinct, often fuscous, with 3 anteapical cells of which innermost, or middle one, or both, may be open basally; outer margin (wings at rest) of 1st apical cell occasionally curved toward commissural margin so that apex of 1st apical cell does not attain apical margin; forewings of female in rest position exceeding apex of ovipositor. Hindleg with femoral setal formula 2:1:1, or occasionally 2:1:1:1; 1st tarsomere approximately equal in length to 2 distal tarsomeres, with 2 parallel rows of plantar setae and setae of one of the rows longer than those of other row.

Male genitalia with pygofer moderately produced with posterodorsal margin convex, posteroventral margin oblique, with a number of large macrosetae near apex and parallel to posteroventral margin, usually with a group of microsetae parallel to ventral margin, without setae on disk, pygofer processes absent; pygofer without more lightly sclerotized areas of flexion. Plates triangular, with uniseriate macrosetae from base to apex. Style short, with distinct lateral lobe on shank, apex truncate, often with a minute angle on mesal margin before apex (not shown in accompanying illustrations).

Connective short, triangular or trapezoidal. Aedeagus with dorsal apodemes well developed, shaft cylindrical (exception: *C. lata*, new species) and without processes (exception: *C. yasumatsui*, new species, which has paired short apical processes); aedeagus not articulated with connective, shaft directed posteriorly or posteroventrad. Paraphyses absent.

Sternal abdominal apodemes well developed in male but length and shape not always consistent within species.

Female abdominal sternum VII produced with posterior margin varying interspecifically; broadly convex, slightly narrowed and truncate, slightly narrowed and emarginate, or gradually narrowed to narrowly rounded apex. Genital chamber without sclerites. Ovipositor 2nd valvulae very broad beyond basal curvature, with ventral margin slightly convex and dorsal margin more strongly convex to anteapical portion which is slightly concave to apex which is located dorsoapically; dorsal margin with quadrate primary teeth except at base, smaller near base, larger apically, each bearing a number of secondary denticles, anteapical portion with numerous denticles, without apicoventral denticles. Pygofer broadly convex dorsoapically with a few macrosetae in a group near apex and a short distance anteroventrally near margin.

Specimens of *Cofana* are lightly sclerotized and require much less time in KOH for maceration (four hours in concentrated solution without heating) than in other genera of Cicadellini. Longer exposure of females to KOH results in twisting of the 2nd valvulae of the ovipositor. The male genitalia are not very useful for identification in most species.

Discussion.—*Cofana* is in the leafhopper subfamily Cicadellinae, tribe Cicadellini of which the New World representatives were treated recently by Young (1977). It belongs to the *Cicadella* generic group discussed in that work. Of the genera in that group, *Cofana* is very similar in appearance to *Plesiommata*. Both of the genera also have conspicuous sternal abdominal apodemes. *Cofana* lacks the basal aedeagal processes found in *Plesiommata* and the paraphyses found in the other genera of the *Cicadella* generic group.

Specimens belonging to *Cofana* Melichar have been examined from New Britain, the Solomon Islands, New Caledonia, Fiji Islands, northern Australia, New Guinea, Borneo, Celebes, Java, Sumatra, Okinawa, the Philippines, Malaya, Singapore, Thailand, Laos, Cambodia, Viet Nam, South China, Formosa, Japan, Korea, Burma, Sikkim, Bengal, Nepal, W. Pakistan, NE. and S. India, Ceylon, Yemen, Iran, Madagascar, Eritrea, Ethiopia, Chad, Senegal, Sierra Leone, Liberia, Ivory Coast, Ghana, Upper Volta, Cameroons, Gabon, Principe Island, French Equatorial Africa, Nigeria, Uganda, Belgian Congo, Tanganyika, Angola, Northern and Southern Rhodesia, Transvaal, Natal and Cape Province.

My interpretation of *Tettigonia albida* Walker is based on the holotype, a specimen from Port Natal, Africa, from which the abdominal apex and the

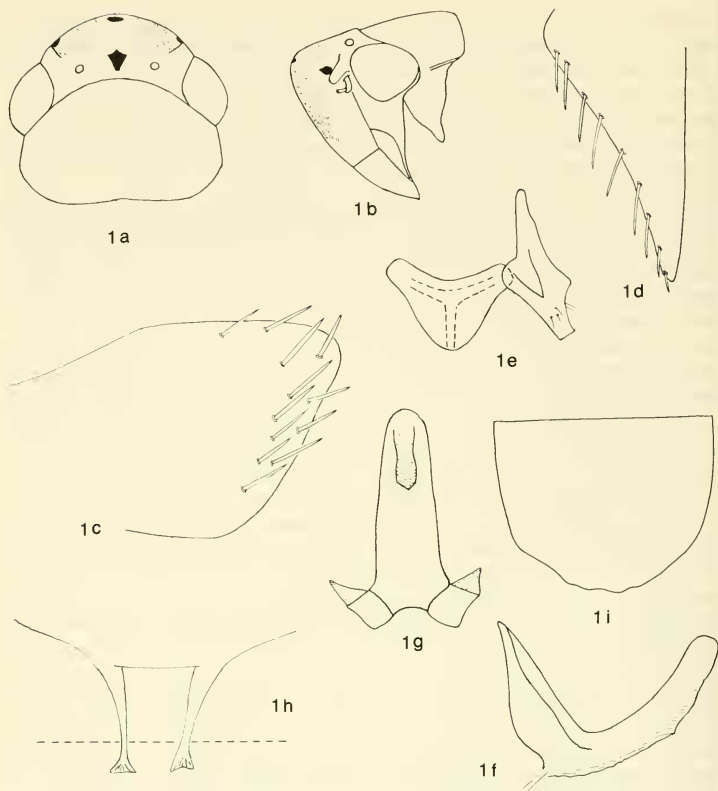


Fig. 1. *Cofana spectra*: a, head and pronotum, dorsal view; b, same, lateral view; c, male pygofer, lateral view; d, male plate, ventral view; e, style and connective, dorsal view; f, aedeagus, lateral view; g, aedeagus, caudoventral view; h, apodemes of male abdominal sternum II (broken line represents conjunctiva); i, female abdominal sternum VII, ventral view (asymmetry is actual) (a-g from interception; h from specimen from Queensland, Australia; i from NW. New Guinea).

right forewing are missing. It agrees closely in form with a series of specimens in BPBM from Palawan in the Philippines and British North Borneo, differing only in that the holotype has only a discal small black spot on the crown, while the Palawan specimens also have a very small black apical spot on the head and a very small black scutellar spot. I cannot account for the discrepancy in localities between the holotype and the other specimens

(Perhaps the holotype was taken aboard ship?). I have seen no other specimen from Africa at all similar to the holotype. The species is very close to *C. eburnea* (Walker).

My interpretation of *Tettigonia eburnea* Walker rests on the male lectotype of which the male genitalia are very similar to the illustrations of *Cofana spectra* (Distant) (Fig. 1). *Cofana eburnea* is a highly variable species with the lectotypes of *Tettigonia quinquenotata* Stål and *Tettigoniella whiteheadi* Distant lying within the limits of variation.

I have not seen type-material of *Tettigonia fuscivenis* Bergroth. Bergroth's original description did not mention an apical spot on the head. I have seen seven specimens from Madagascar from MMB and two from RMS, all without an apical spot on the head and all belonging to *Cofana unimaculata* (Signoret) as interpreted in the present work. Nevertheless, without having seen Bergroth's specimens, I am unwilling to synonymize the two names, although the probability is that they should be synonymized.

I have seen a paratype of *Poecilocardia grisea* Evans, but it was not at hand as this was written. There is no doubt that it belongs in *Cofana*.

I have seen no type-specimen of *Kolla lineatus* Distant. Two specimens in MMB were determined by Melichar as a variety of *Cicadella spectra* (Distant). A number of specimens at hand fit the original description well, except that all are smaller than Distant stated (5.4–6.6 mm vs. 7 mm), and I have seen no other species from Ceylon that would fit the description.

Although I selected a lectotype of *Tettigonia nigrilinea* Stål in RMS, my knowledge of *Cofana* at that time was only sufficient to place it generically. There are four species with a size range of males fitting the original description and with a conspicuous dark median line on the pronotum and scutellum (*jedarfa*, new species, *lineata* (Distant), *perkinsi* (Kirkaldy), and *nigrilinea*); only one occurs in the Philippines. I have determined this species as *nigrilinea*.

Kirkaldy (1905b:319) wrote a key to the cicadelline species that he included in that paper. The species are numbered in the key, with the new species *perkinsi* being number 2. He then proceeded to describe the species in numerical order with the number and name of each species in its center-head. There is no species numbered "2," but a center-head: "*koebelei*, sp. nov." appears between "1. *albida* (Walker)" and "3. *pasiphae*, sp. nov." One concludes that the description *koebelei* applies to the species "2. *perkinsi* sp. nov." of the key. Both names are available, but *perkinsi* has line priority. I have seen no specimens of this species from Australia (type-locality Cairns, Queensland), but I have based my determination on a specimen from Port Moresby, New Guinea that agrees with the original description of *koebelei* and with Evans' 1966a:144, Fig. 23D illustration.

I have identified *Tettigoniella spectra* Distant in the sense of the lectotype in BM. Distant proposed this name as a substitute name for *Tettigonia*

*albida* Signoret. But Signoret's *albida* was merely a misdetermination of the Walker species, not a separate proposal, and therefore not a homonym, and there was no type-series. Distant's "new name" actually constituted a separate proposal, and I therefore designated a lectotype for *spectra* (Young, 1965:194).

My identification of *Tettigonia subvirescens* Stål agrees with the lectotype. This species is easily recognized by the somewhat coriaceous greenish forewings.

At the time I designated the lectotype of *Tettigonia unimaculata* Signoret, I recognized the species as a close relative of *Cofana spectra* (Distant). Signoret pointed out the significance of the lack of an apical black spot on the head in his original description. Although some specimens of other species share this character (see key), it is important in species recognition. I have seen the types of the nominal species listed in synonymy in the accompanying list of species, except *Kolla tripunctifrons* Banks which Metcalf (1965:430) placed in *Cofana*. A specimen from Luzon determined by Melichar as *tripunctifrons* is the same as *unimaculata* Signoret.

A number of authors have reported *Cofana spectra* (Distant) from economic plants including rice, barley, wheat, sugarcane and sorghum. Misra (1920a:229) reported it from grass. Esaki and Ito (1954a:16) reported it also from "rush" and from mulberry. But all this information needs to be verified in the light of refinements in our knowledge of species recognition. Clausen (1931a:45) reported *C. subvirescens* (Stål) from sugarcane. Most of these accounts fail to state that the species observed was very important economically, even though feeding, or occurring on, economic plants. Undoubtedly several species occur commonly in paddies, and one apparently has been observed to oviposit on rice plants. Ishihara (1971:18) reported *Yasumatsuus mimicus* Distant (misdetermination = *Cofana yasumatsui*, new species described herein) as a pest of rice and illustrated the last instar nymphs.

#### SPECIES OF *COFANA*

*albida* (Walker), 1851b:767 (*Tettigonia*). Philippines: Palawan; Br. N. Borneo. NEW COMBINATION.

*eburnea* (Walker), 1857b:168 (*Tettigonia*). Philippines: Luzon, Mindoro, Negros, Leyte, Palawan, Mindanao; Borneo: Br. N. Borneo, Sarawak; W. Sumatra. NEW COMBINATION.

*quinquenotata* (Stål), 1870c:734 (*Tettigonia*). NEW SYNONYMY.

*whiteheadi* (Distant), 1908f:142 (*Tettigoniella*). NEW SYNONYMY.

*fuscivenis* (Bergroth), 1894a:2 (*Tettigonia*). Madagascar. NEW COMBINATION.

*grisea* (Evans), 1955b:9 (*Poecilocarda*). Belgian Congo. NEW COMBINATION.



*hoogstraali*, NEW SPECIES. Dutch New Guinea, New Britain.

*jedarfa*, NEW SPECIES. Belgian Congo, Uganda.

*lata*, NEW SPECIES. S. China, Viet Nam, Java.

*lineata* (Distant), 1908g:224 (*Kolla*). Nepal, NE. India, S. India, Ceylon, Java. NEW COMBINATION.

*maai*, NEW SPECIES. NE. New Guinea.

*medleri*, NEW SPECIES. Liberia, Nigeria, Chad, Gabon, Principe Is., Fr. Equatorial Africa, Belgian Congo, Rhodesia, Transvaal.

*nigrilinea* (Stål), 1870c:735 (*Tettigonia*). Formosa; S. China; Viet Nam; S. India; N. and S. Malaya; Singapore; Sarawak; N. Borneo; Philippines: Palawan, Negros, Mindanao; Dutch New Guinea; NE. New Guinea: Papua; New Britain; Bougainville; Guadalcanal. NEW COMBINATION.

*perkinsi* (Kirkaldy), 1906c:319 (*Tettigonia*). New Guinea: Papua; [Australia: Queensland]. NEW COMBINATION.

*koebelei* (Kirkaldy) *loc. cit.* (*Tettigonia*). NEW SYNONYMY.

*polaris*, NEW SPECIES. Liberia, Upper Volta, Nigeria, Belgian Congo.

*separata*, NEW SPECIES. Is. of New Britain.

*sotoi*, NEW SPECIES. Sierra Leone.

*spectra* (Distant), 1908g:211 (*Tettigoniella*). Fr. Equatorial Africa: Senegal; Sierra Leone; Liberia; Ghana; Nigeria: Cape Province; Natal; Transvaal; Chad; Rhodesia; Tanganyika; Uganda; Ethiopia; Eritrea; Yemen; Iran; W. Pakistan; Nepal; Sikkim; Formosa; S. China; Burma: Shan States, Tenasserim; Laos; Thailand; Viet Nam; Bengal; Calcutta; S. India; Ceylon; Malaya; Java; Sumatra; Okinawa; Philippines: Luzon, Mindoro, Negros, Leyte, Palawan, Mindanao; N. Borneo; Sarawak; N. Celebes; Dutch New Guinea, NE. New Guinea, Papua; Australia: N. Territory, Queensland; New Britain; New Caledonia; Fiji Is.; Guadalcanal. NEW COMBINATION.

*subvirescens* (Stål), 1870c:734 (*Tettigonia*). W. Pakistan; S. China; Ceylon; Viet Nam; Burma; Thailand; Malaya: Pahang, Malacca; Sumatra; Java; Philippines: Luzon, Negros, Misamis, Mindanao; New Guinea. NEW COMBINATION.

*unimaculata* (Signoret), 1854a:26 (*Tettigonia*). Fr. Equatorial Africa: Senegal; Sierra Leone; Liberia; Ghana; Upper Volta; Nigeria; Br. Cameroons; Gabon; Belgian Congo; Uganda; Tanganyika; Northern Rhodesia; Transvaal; Natal; Madagascar; S. China; NE., NW. and S. India; Ceylon; Nepal; Formosa; Laos; Cambodia; Viet Nam; W. Pakistan; Burma: Rangoon, Tenasserim; Malaya; Singapore; Java; Philippines: Luzon, Mindoro, Negros, Cebu, Samar, Palawan, Mindanao; Borneo; Dutch New Guinea; Australia: Queensland. NEW COMBINATION.

*punctum* (Taschenberg), 1884a:445 (*Tettigonia*). NEW SYNONYMY.

*mimica* (Distant), 1908g:225 (*Kolla*). NEW SYNONYMY.

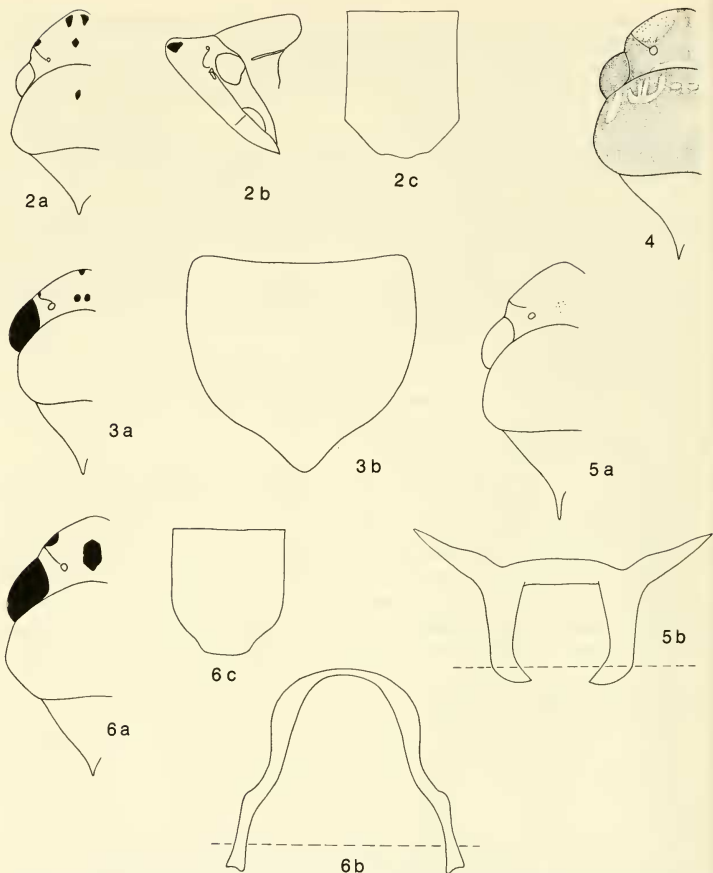


Fig. 2. *Cofana eburnea*: a, anterior dorsum; b, head and pronotum, lateral view; c, female abdominal sternum VII (all from lectotype of *Tettigonia quinquenotata* Stål, from Philippine Islands). Fig. 3. *Cofana maai*: a, anterior dorsum; b, female abdominal sternum VII (both from holotype). Fig. 4. *Cofana separata*, anterior dorsum (holotype). Fig. 5. *Cofana hoogstraali*, male: a, anterior dorsum; b, sternal abdominal apodemes (broken line represents conjunctiva) (from specimen from Dutch New Guinea). Fig. 6. *Cofana unimaculata*: a, anterior dorsum; b, sternal abdominal apodemes of male (broken line represents conjunctiva) (from specimen from eastern Negros Island, Philippines); c, female abdominal sternum VII (from specimen from Gabon).



*tripunctifrons* (Banks), 1910a:51 (*Kolla*). NEW SYNONYMY.  
*differentialis* (Baker), 1914a:420 (*Tettigoniella*). NEW SYNONYMY.  
*hopinensis* (Distant), 1918b:3 (*Tettigoniella*). NEW SYNONYMY.  
*yasumatsui*, NEW SPECIES. S. China, Viet Nam, Thailand, Sarawak, Borneo, Java.

KEY TO SPECIES OF *COFANA*

(*C. grisea* (Evans) and *C. fuscivenis* (Bergroth) not included)

- 1. Head with transocular width less than greatest width of pronotum ..... 2
  - Head with transocular width equal to or greater than greatest width of pronotum ..... 3
- 2. Forewing with inner anteapical cell closed basally ..... *albida* (Walker)
  - Forewing with inner anteapical cell open basally (Fig. 2) ..... *eburnea* (Walker)
- 3. Crown with paired discal spots or with a discal transverse marking (Fig. 3) ..... *maai*, new species
  - Crown with one discal spot or a longitudinal line, or without discal marking ..... 4
- 4. Head without a median apical black spot. .... 5
  - Head with a median apical black spot ..... 9
- 5. Length of male 9.2 mm or more; of female 10 mm or more ..... 6
  - Length of male 5.3–8.0 mm; of female 5.3–9.4 mm ..... 7
- 6. Crown and pronotum dark, marked with yellow (New Britain) (Fig. 4) ..... *separata*, new species
  - Crown and pronotum usually unmarked (crown rarely with a dark median discal spot) (New Britain and Dutch New Guinea) (Fig. 5) ..... *hoogstraali*, new species
- 7. Head with a median pale spot at transition from crown to face ..... 8
  - Head without such a spot (Fig. 6) ..... *unimaculata* (Signoret)
- 8. Pronotum and scutellum with a conspicuous dark line ..... *polaris*, new species
  - Pronotum and scutellum unmarked ..... *sotoi*, new species
- 9. Large specimens, length usually 10 mm or more; female abdominal sternum VII truncate apically but slightly convex medially (Fig. 7) ..... *subvirescens* (Stål)
  - Without above combination of characters; length almost always less than 10 mm ..... 10
- 10. Crown with a median posterior longitudinal dark marking that continues as a median pronotal dark stripe without interruption ..... 11
  - Crown not so marked, with a broader median discal spot ..... 12

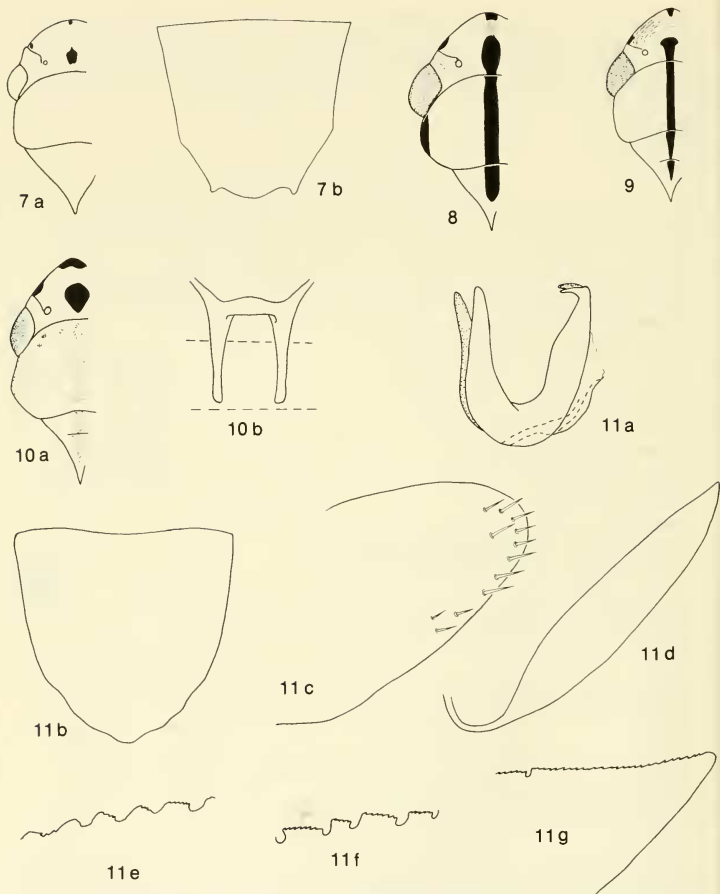


Fig. 7. *Cofana subvirescens*, lectotype: a, anterior dorsum; b, female abdominal sternum VII. Fig. 8. *Cofana perkinsi*, anterior dorsum (from specimen from Port Moresby, New Guinea). Fig. 9. *Cofana jedarfa*, holotype, anterior dorsum. Fig. 10. *Cofana lineata*: a, anterior dorsum; b, apodemes of male abdominal sternum II (from specimen from Kandy, Ceylon). Fig. 11. *Cofana yasumatsui*: a, holotype, aedeagus, lateral view; b, female abdominal sternum VII; c, female pygofer, lateral view; d, second valvula of ovipositor; e, teeth near base of second valvula; f, teeth near middle of same; g, apex of second valvula (b-g from topotype).

- 11. Lateral pronotal margins dark, in dorsal view (Papua, N. Australia) (Fig. 8) ..... *perkinsi* (Kirkaldy)
  - Lateral pronotal margins not dark-bordered in dorsal view (Central Africa) (Fig. 9) ..... *jedarfa*, new species
- 12. Head produced and triangular; specimens smaller (length of male 5.4–5.9 mm; of female 6.0–6.6 mm); head with median length  $\frac{6}{10}$  interocular width or more; with a median pronotal line continuing onto scutellum (Fig. 10) ..... *lineata* (Distant)
  - Head less produced, more broadly rounded at apex; specimens larger (length at least 6.3 mm in male; 7.7 mm in female); head with median length less in relation to interocular width; with or without median pronotal line that continues onto scutellum ..... 13
- 13. Forewing with middle anteapical cell open basally; male with a pair of short apical aedeagal processes (Fig. 11) .....
  - ..... *yasumatsui*, new species
  - Forewing with middle anteapical cell usually closed basally; male without aedeagal processes ..... 14
- 14. Pronotum with 3 parallel brown longitudinal lines on disk, all extending onto scutellum; aedeagal shaft broad in lateral view (Fig. 12) ..... *lata*, new species
  - Pronotum with only one line extending onto scutellum, or none; aedeagal shaft cylindrical, not broader in lateral than in ventral view ..... 15
- 15. Specimens more robust; female abdominal sternum VII with posterior margin slightly undulate, but broadly convex (much as in *yasumatsui*, Fig. 11) (Fig. 1) ..... *spectra* (Distant)
  - Specimens more slender; female abdominal sternum VII narrowed and truncate or emarginate apically ..... 16
- 16. Head with median discal spot usually larger; often with a median pronotal dark stripe extending onto scutellum; female abdominal sternum VII narrowed and truncate apically (Palearctic, Oriental, Australian) (Fig. 13) ..... *nigrilinea* (Stål)
  - Head with median discal spot usually smaller; without such a pronotal stripe; female abdominal sternum VII narrowed and emarginate apically (Ethiopian) (Fig. 14) ..... *medleri*, new species

*Cofana maai* Young, NEW SPECIES  
Fig. 3

Description.—Length of female 7.9–8.2 mm.  
Head with median length of crown approximately  $\frac{4}{10}$  interocular width and from  $\frac{1}{4}$  to slightly more than  $\frac{1}{4}$  transocular width, anterior margin broadly rounded in dorsal view; ocelli behind a line between anterior eye angles; crown with a slight transverse concavity between ocelli; antennal

ledges in lateral view with anterior margins oblique and concave; clypeus flattened and granulate medially, muscle impressions distinct, transclypeal suture interrupted medially, clypellus with contour of its lower portion very slightly more nearly horizontal than profile of clypeus.

Pronotum with greatest width less than transocular width of head, dorsopleural carinae incomplete, posterior portion of disk weakly transversely rugulose; scutellum not transversely rugulose; forewing with veins fuscous, with anteapical cells closed basally.

Male genital characters much as in *C. spectra* (Fig. 1). Female abdominal sternum VII with posterior margin converging obliquely to narrowly convex apex.

Crown with a pair of fuscous close-set spots near median line (type) between ocelli or with a transverse fuscous marking, apex of head usually (holotype) with a small fuscous median spot bordered with yellow; pronotum unmarked (type) or with a faint median fuscous line; scutellum unmarked. Face with a small fuscous spot on each side bordering margin of antennal ledge at transition from face to crown, median portion of clypeus pale, areas of muscle impressions darker; remainder of face, thoracic venter and pleura, abdominal venter, and legs dull yellow except dark bases of tibial setae.

Material Examined.—Holotype ♀, Maprik, NE. New Guinea, 150 m, Dec. 29, 1959–Jan. 17, 1960 (T. C. Maa); 1 ♀, Sepik, Maprik area, NE. New Guinea, 160 m, Aug. 23, 1957 (D. Elmo Hardy); and 1 ♀, Sepik River, Pagwi area, 5 m, Aug. 25, 1957 (D. Elmo Hardy) (BPBM); 2 ♀ and 4 ♂, Hollandia, New Guinea, March, 1945 (K. L. Knight) (USNM).

Diagnosis.—This species can be separated from all other species of *Cofana* by the distinctive form of the female abdominal sternum VII.

Etymology.—The species is named in honor of the collector of the holotype, whose collections have contributed much to the knowledge of the Cicadellinae.

#### *Cofana separata* Young, NEW SPECIES

Fig. 4

Description.—Length of male 9.9 mm, of female 11.5 mm.

Head with median length of crown approximately  $\frac{6}{10}$  interocular width and slightly less than  $\frac{4}{10}$  transocular width, anterior margin broadly rounded in dorsal view; ocelli on (male) or before (female) a line between anterior eye angles, each approximately equidistant from median line and adjacent anterior eye angle; crown with a slight transverse concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and convex; clypeus convex and granulate medially, clypellus with contour of its lower portion slightly (male) or greatly (female) more nearly horizontal than profile of clypeus.

Pronotum with greatest width approximately equal to transocular width of head, dorsopleural carinae incomplete, posterior portion transversely rugose, scutellum transversely rugulose behind transverse impression; forewing with veins fuscous, with anteapical cells closed basally, outer margin of inner apical cell curved towards commissural margin and apex of inner apical cell not attaining wing apex as a result.

Male genitalia as in generic description. Female abdominal sternum VII with posterior margin gradually and regularly convex.

Crown and pronotum dark except area including muscle impressions (which are also dark) and narrow area adjacent to posterior margin on crown, and a group of irregular submarginal markings near anterior margin of pronotum, which are dull yellow; scutellum of female very pale with median area narrowly dark in basal  $\frac{1}{2}$ , expanded to include all of portion behind transverse impression; basal portion of scutellum obscured medially by pin in male, apical portion concolorous with remainder. Clypeus of male black except yellow lines between muscle impressions; clypeus of female as in male except lower portion and broad lateral portion adjoining gena on each side, which are yellow; clypellus and posterior portion of genae dull yellow; proepimeron dark beneath dorsopleural carina; mesepimeron dark in male; male with legs dark beyond knees (femoro-tibial joints), female with prothoracic legs broken off at knees, mesothoracic legs dark beyond knees, metathoracic legs pale except ventral apices of tibiae and 2 apical tarso-meres, which are dark.

Material Examined.—Holotype ♂, Sio, N. coast, New Britain, 600 m, July 24, 1956 (E. J. Ford, Jr.), and 1 ♀, Gazelle Peninsula, Bainings, St. Paul's, New Britain, 350 m, Sept. 6, 1955 (J. L. Gressitt) (BPBM).

Diagnosis.—*Cofana separata* differs from other species in the genus by the distinctive markings of the anterior dorsum and by the shape of the head.

### *Cofana hoogstraali* Young, NEW SPECIES

Fig. 5

Description.—Length of male 9.2–9.5 mm, of female 10.0–10.2 mm.

Head with median length of crown from slightly less than  $\frac{6}{10}$  to almost  $\frac{7}{10}$  interocular width and from slightly more than  $\frac{1}{3}$  to more than  $\frac{4}{10}$  transocular width, anterior margin well produced for the genus; ocelli aligned with anterior eye angles; crown with a slight concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and concave; clypeus convex medially and smooth, muscle impressions distinct, transclypeal suture entire, clypellus with contour of its lower portion continuing profile of clypeus or slightly more nearly horizontal than profile of clypeus.

Pronotum with greatest width less than transocular width of head, dor-

sopleural carinae incomplete, posterior portion of pronotum transversely rugulose; scutellum transversely rugulose behind transverse impression; forewing with veins concolorous with remainder of wing, with anteapical cells closed basally.

Male genital characters much as in *C. spectra* (Fig. 1). Female abdominal sternum VII with posterolateral margins oblique, convergent, apex subtruncate (much as in illustration of *C. eburnea* (Walker), Fig. 2).

Crown and pronotum yellowish-green (in some specimens, Fig. 5, with a discal coronal black spot), scutellum and forewings pale yellowish-white. Clypeus greenish-yellow, at least medially, remainder of face, thoracic venter and pleura, legs and abdominal venter dull yellow; femora without black spots at bases of macrosetae.

Material Examined.—Holotype ♀, Keravat, New Britain, May 17, 1956 (G. Dun); 1 ♂, Gazelle Peninsula, Upper Warangoi, Illugi, New Britain, 230 m, November 25–26, 1962 (J. Sedlacek); 1 ♂ and 2 ♀, Malmalwan-Vunakanau, Gazelle Peninsula, New Britain, May 4, 6, and 8, 1956 (J. L. Gressitt); 1 ♂, Guega, W. of Swart Valley, Dutch New Guinea, November 15, 1958 (J. L. Gressitt) (BPBM). Seven ♂, 250 ft., January 31, March 19, May; 2 ♂ and 2 ♀, kundi grass, Cyclops Mts. foothills, 500 ft., March 7; 3 ♂ and 1 specimen without abdomen, edge of kunar grass and forest, 1800 ft., March 15; 1 ♂, rain forest, February 9, all Hollandia, New Guinea, 1945 (H. Hoogstraal) (NCS).

Diagnosis.—The produced crown and the (usual) lack of dark markings will distinguish *C. hoogstraali* from other species of *Cofana*.

Etymology.—The species is named in honor of Harry Hoogstraal who collected most of the specimens at hand.

### *Cofana polaris* Young, NEW SPECIES

Description.—Length of male 5.3–6.3 mm, of female 5.3–7.2 mm.

Head with median length of crown from  $\frac{6}{10}$  to  $\frac{8}{10}$  interocular width and from slightly less than  $\frac{4}{10}$  to almost  $\frac{1}{2}$  transocular width; ocelli on or slightly behind a line between anterior eye angles, each closer to adjacent anterior eye angle than to median line of crown; crown usually with a slight transverse concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and either rectilinear or convex; clypeus convex and granulate medially; transclypeal suture interrupted medially, clypellus with contour a continuation of profile of clypeus.

Pronotum with greatest width less than transocular width of head, dorsopleural carinae incomplete, posterior portion of disk transversely rugulose; forewing with veins fuscous, middle anteapical cell open or closed basally.

Female abdominal sternum VII gradually narrowed to concave apex (much as in illustration of *C. unimaculata* (Signoret), Fig. 6) but with posterior margin concave.

Crown dull yellow to greenish gray, with a median black spot on posterior portion partly or completely surrounded by pale yellow; apical median area dark between 2 dorsal areas of muscle impressions in some specimens (holotype); pronotum dull yellow to fuscous, with a black median line continuing over scutellum to a varying extent (to apex in holotype), basal angles of scutellum dark (holotype) or not; face with a median basal yellow spot surrounded by fuscous, a black spot surrounded by yellow adjoining each antennal ledge; clypeus and clypellus yellow to brown, with median line pale and with pale arcs on area of muscle impressions, clypellus dark medially; lora yellow with dark markings, or black; proepisternum usually black, proepimeron with dorsopleural carina dark-bordered or not; hindlegs as in *jedarfa* (new species below) or with dark areas much less distinct (holotype).

Material Examined.—Holotype ♂, Genewonday, Liberia, "2-17-58-19" roadside (C. Blickenstaff); 1 ♀, K. State, N. Bussa, Nigeria, December 1, 1970 (J. T. Medler); 1 ♀, Gangala Na Bodio, Belgian Congo, April 29, 1955 (Baker and Schmidt); 1 ♀, 9 mi S. Nobera, Upper Volta, 11°26'N, 1°10'W, November 8–9, 1968, AMP, light trap, 6 PM–6 AM (USNM). One ♂, 40 mi E. of Matadi, Belgian Congo, July 29, 1957 (E. S. Ross and R. E. Leech) (CAS). One ♀, "Savane de Mbouma," March 12, 1968 (Michel Boulard) (MHNP). One ♂ and 1 ♀, Zaria, November 2, 1975; 2 ♀, Zaria, November 5, 1975; 1 ♂, Zaria, September 13, 1974; 1 ♀, Ibadan, December 15–19, 1975; 2 ♂, near Kafanchan, Kagoro Forest, November 13, 1976, all N. Nigeria (all J. C. Deeming) in collection of Institute for Agricultural Research, Samaru, Nigeria.

Diagnosis.—The presence of the pale apical head-spot and the longitudinal dark line of the pronotum are diagnostic for *C. polaris*.

### *Cofana jedarfa* Young, NEW SPECIES

Fig. 9

Description.—Length of male 7.3 mm, of female 7.2–7.8 mm.

Head with median length of crown from slightly less than  $\frac{6}{10}$  to slightly less than  $\frac{2}{3}$  interocular width and from slightly less than  $\frac{4}{10}$  to approximately  $\frac{4}{10}$  transocular width; ocelli on a line between anterior eye angles; crown with a slight transverse concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and concave; clypeus flattened and granulate medially, transclypeal suture entire, clypellus with contour a continuation of profile of clypeus.

Pronotum with greatest width less than transocular width of head, dorsopleural carinae incomplete, posterior portion of disk transversely rugulose; forewing with veins fuscous, middle anteapical cell open or closed basally.

Female abdominal sternum VII gradually narrowed to concave apex (much as in illustration of *C. subvirescens*, Fig. 7).



Dorsum pale tan with a black spot at apex of head; a median dark spot close behind it on crown between muscle impressions; and a black spot between ocelli narrowing and extending to posterior margin of head and continuing through pronotum and onto scutellum almost to its apex; forewing with veins fuscous; face with the black apical head-spot bordered with yellow, with a black spot on each side contiguous with anterior margin of antennal ledge or nearly so, clypeus brown with a narrow yellow median line extending laterally on each side above transclypeal suture then dorsally along lateral clypeal suture and expanding to surround black spot next to antennal ledge, with narrow transverse yellow lines on each side in area of muscle impressions, clypellus yellow with a dark median line, genae and lora yellow, each lorum with a dark margin that gives off a branch across the adjacent gena to its posterior margin; with a black spot on proepimeron surrounding the dorsopleural carina, and another near dorsal margin of mesepisternum, anterior margins of femora of metathoracic legs, in rest position, dark, bases of tibial setae of row 3 dark, remainder of pleura and venter pale.

Material Examined.—Holotype ♂, Faradje, Congo, 29°40'E, 3°40'N, January 1913 (Lang and Chapin) (AMNH); 1 ♀, Katona, Uganda, August 1913 (Majenje) (HNHM); one parasitized ♂, Ankole, Kichwamba, Uganda, April 23–29, 1968 (P. J. Spangler) (USNM).

Diagnosis.—In appearance, *C. jedarfa* is similar to *C. polaris* and *C. perkinsi*, *C. nigrilinea* and *C. lineata* and from all of which it may be separated by the characters in the key. The pronotum of *jedarfa*, in lateral view, has a dark border above and below the dorsopleural carina; but the pronotum does not appear dark-bordered laterally from a dorsal view, as in *C. perkinsi*. The female abdominal sternum VII of *C. perkinsi* is similar to that found in *C. spectra*.

### *Cofana yasumatsui* Young, NEW SPECIES

Fig. 11

Description.—Length of male 6.4–7.5 mm, of female 7.2–8.0 mm.

Head with median length of crown from slightly more than  $\frac{1}{2}$  to  $\frac{6}{10}$  interocular width and from  $\frac{3}{10}$  to almost  $\frac{4}{10}$  transocular width; ocelli on (female) or behind (male) a line between anterior eye angles; crown usually with a slight transverse concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and convex; clypeus flattened and granulate medially, muscle impressions distinct or not, transclypeal suture entire, clypellus with contour of its lower portion continuing profile of clypeus or slightly more horizontal.

Pronotum with greatest width less than transocular width of head, pos-

terior portion of disk rugulose; scutellum not rugulose; forewing with veins fuscous, with middle anteapical cell usually open basally.

Male pygofer, styles and connective much as in illustration of *Cofana medleri* (Fig. 14); aedeagus in lateral view with a pair of short apical acute processes directed towards bases of dorsal apodemes. Female abdominal sternum VII gradually narrowed and convex apically, with posterolateral margins slightly undulate (much as in *C. spectra*).

Crown with a large median black spot, apex with a smaller median black spot narrowly bordered with yellow; pronotum unmarked or with a faint median fuscous stripe (type). Face with a black spot on each side bordering margin of antennal ledge at transition from face to crown, with a dark stripe on each side of clypeus over area of muscle impressions and narrowing below, clypellus with median line dark, remainder of face, thoracic pleura and venter tan to sordid yellow; legs tan to dull yellow, hindlegs with anterior margins of femora, in rest position, and with bases of tibial setae of row 3, dark.

Material Examined.—Holotype and 4 additional ♂ and 3 ♀ Fyan, Viet Nam, 1200 m, July 11–August 9, 1961 (N. R. Spencer); 3 ♂, 10 ♀ and 1 specimen without abdomen, same data except 900–1000 m; 2 ♀, DaLat, Viet Nam, 1500 m, September 26–27, 1960 (C. M. Yoshimoto); 1 ♀ and 1 specimen without abdomen, same data as last preceding except collector (J. L. Gressitt); 1 ♀, DaLat, Viet Nam, September 11, 1960, 1550 m (J. L. Gressitt); 3 ♂, 6 km S. of DaLat, Viet Nam, June 9–July 7, 1961 (N. R. Spencer); 1 ♀, Van Gia, N. of Nha Trang, Viet Nam, November 29–December 5, 1960 (C. M. Yoshimoto); 1 ♀, Ap Hung Long, 21 km NW of Di Linh, Viet Nam, November 29–December 5, 1960 (C. M. Yoshimoto); 2 ♂, Di Linh (Djiring), September 27–October 14, 1960 (C. M. Yoshimoto); 1 ♂ and 2 ♀, NW. of Chiangmai, Doi Suthep, Thailand, 1278 m, March 29–April 4, 1958 (T. C. Maa); 1 ♀, Chiangmai, Fang, NW. Thailand, 500 m, April 12, 1958 (T. C. Maa); 2 ♂ and 1 ♀, Sarawak, Nanga Pelagus, near Kapit, Borneo, 180–585 m, August 7–14, 1958 (T. C. Maa); 1 ♂, Sarawak, Marirai, V., Kapit Dist., Borneo, 30–300 m, August 1–6, 1958 (T. C. Maa); 3 ♂ and 1 ♀, Sarawak, Sedong, Kampong Tapuh, Borneo, 300–450 m, July 10, 1958 (T. C. Maa); 1 ♂, same data as last preceding except date, July 4–9, 1958; 1 ♂ and 1 ♀, Sarawak, Bau District, Pangkalen Tebang, Borneo, 300–450 m, September 6, 1958 (T. C. Maa); 1 ♀, Keningan, British N. Borneo, Jan. 12–17, 1959 (T. C. Maa) (all in BPBM). Also, one pair *in copula*, S. Halimoen, Java, November, 1938 (ZIL). One ♂ Yin Na San, E. Kwantung, China, June 16, 1936 (L. Gressitt) (NCS).

Diagnosis.—*Cofana yasumatsui* is the species upon which Dr. Ishihara based his genus *Yasumatsuus*. The aedeagus differs from all other species in its short apical processes.

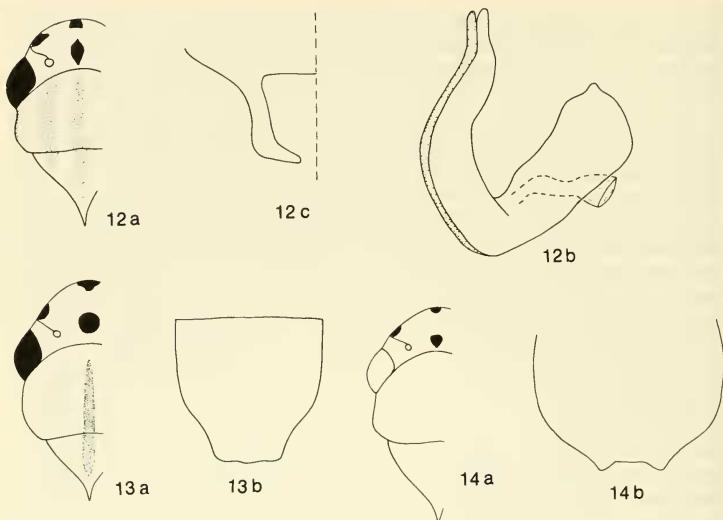


Fig. 12. *Cofana lata*, holotype: a, anterior dorsum; b, aedeagus, lateral view; c, left apodeme of male abdominal sternum II (broken line is median). Fig. 13. *Cofana nigrilinea*: a, anterior dorsum; b, female abdominal sternum VII (a from specimen from Mindanao; b from Sarawak). Fig. 14. *Cofana medleri*: a, anterior dorsum; b, female abdominal sternum VII (a from Stanleyville, b from Lukolela, both Belgian Congo).

### *Cofana lata* Young, NEW SPECIES

#### Fig. 12

Description.—Length of male 8.3 mm, of female 8.4–9.7 mm.

Head with median length of crown between  $\frac{5}{10}$  and  $\frac{6}{10}$  interocular width and from  $\frac{3}{10}$  to slightly less than  $\frac{4}{10}$  transocular width, anterior margin broadly rounded in dorsal view; ocelli on or behind a line between anterior eye angles; crown with a transverse concavity between ocelli; antennal ledge in lateral view with anterior margin oblique, either convex or concave; clypeus broadly convex and granulate medially, muscle impressions distinct, transclypeal suture complete, clypellus with contour of its lower portion very slightly more nearly horizontal than profile of clypeus.

Pronotum with greatest width less than transocular width of head, dorsopleural carinae incomplete, posterior portion of disk weakly transversely rugulose; scutellum not transversely rugulose; forewing with veins fuscous, with anteapical cells closed basally.

Male with aedeagal shaft much broader than in other species of the genus, other male genital characters much as in *C. spectra* (Fig. 1). Female abdominal sternum VII with posterior margin much as in *C. subvirescens* (Fig. 7).

Crown with a median discal black spot between ocelli and a median black spot bordered with yellow at apex; pronotum and scutellum with ground color concolorous with crown, with 3 longitudinal brown stripes over disk of pronotum extending onto scutellum, the median one attaining apical  $\frac{1}{2}$  of scutellum, the lateral ones ending just behind posterior pronotal margin, lateral pronotal margin narrowly bordered with brown; forewing with veins fuscous. Face with clypeus and clypellus marked as in *C. yasumatsui* but with dull yellow arcs in the dark area of the muscle impressions; pleura, venter, and legs as in *yasumatsui*.

Material Examined.—Holotype ♂, Wong Sa Shui, S. Kiangsi, China, June 12, 1936 (L. Gressitt) (NCS); 1 ♀, Tisolak, Java (RMS); 1 ♀, 17 km E. of Phanthiet Rd., Viet Nam, October 6, 1960 (C. M. Yoshimoto), and 1 ♀, Fyan, Viet Nam, 1200 m, July 11–August 9, 1961 (N. R. Spencer) (BPBM). Holotype on indefinite loan to USNM.

Diagnosis.—*Cofana lata* is more similar externally to *C. spectra* than to other species in the genus, but may be separated from it, and from other species by the pronotal stripes in combination with either the form of the aedeagus in the male or, with the form of the seventh abdominal sternum of the female.

### *Cofana medleri* Young, NEW SPECIES

Fig. 14

Description.—Length of male 7.3–7.9 mm, of female 9.0–9.3 mm.

Head with median length of crown from  $\frac{1}{2}$  to almost  $\frac{6}{10}$  interocular width and from  $\frac{3}{10}$  to slightly less than  $\frac{4}{10}$  transocular width, anterior margin broadly rounded in dorsal view; ocelli usually located behind a line between anterior eye angles; crown with or without a transverse concavity between ocelli; antennal ledges in lateral view with anterior margins oblique and rectilinear; clypeus convex and granulate medially, muscle impressions distinct, transclypeal suture usually entire, clypellus with contour of its lower portion continuing profile of clypeus.

Pronotum with greatest width less than transocular width of head, dorsopleural carinae incomplete, posterior portion of disk transversely rugulose; scutellum rugulose or not on its posterior portion; forewings with veins not fuscous, with anteapical cells closed basally.

Male genitalia much as in *Cofana spectra*, but with styles slightly longer. Female abdominal sternum VII with posterior margin tapered on each side of shallowly excavated median portion.

Crown with ground color of anterior  $\frac{1}{2}$  tan, of posterior  $\frac{1}{2}$  paler tan to

dull white, disk with a small median black spot near posterior margin, apex of head with a small median black spot bordered with white; pronotum and scutellum concolorous with posterior  $\frac{1}{2}$  of crown, unmarked. Face with a black spot bordering margin of antennal ledge at transition from face to crown, clypeus and clypellus marked as in *Cofana yasumatsui*; thoracic pleura, venter, and legs tan to yellow, without black markings.

Material Examined.—Holotype and two additional ♀ Umuahia, CRIN EC State, Nigeria, April 10, 1973 (J. T. Medler); 1 ♂, Benin NIFOR MW State, April 1, 1975 (J. T. Medler); 1 ♂ and 1 ♀, Cape Vert, Senegal, French West Africa (Fred Morrison) (NCS). One ♀, Lukolela [Belgian Congo], July 17, 1909 (Lang and Chapin; 1 ♀ Stanleyville, Belgian Congo,  $25^{\circ}10'E$ ,  $0^{\circ}30'N$ , August 10, 1909 (same collectors); 1 ♂ and 1 ♀, Matadi, Belgian Congo,  $13^{\circ}30'E$ ,  $6^{\circ}0'S$ , June 24, 1909 (same collectors) (AMNH). One ♂ and 1 ♀, Benin, Asaba, Nigeria, Jan. 3, 1949 (B. Malkin); 3 ♀, Lokoja, Kabba Province, Nigeria, February 24–28, 1949 (B. Malkin) (CAS). One ♂ and 1 ♀, Yaba-Lagos, Nigeria, August 1, 1964 (Mir S. Mulla) (University of California, Riverside). Two ♂ and 1 ♀, Douala, Cameroons, May 8, 1954, 1 ♀, same locality, December 2, 1956, 1 ♀, same locality, August 20, 1956; 1 ♂ and 1 ♀, Abidjan, Ivory Coast, June 16, 1957; 1 ♂ and 1 ♀, Abidjan, Ivory Coast, January 23, 1959; 1 ♀, Monrovia, Liberia, May 5, 1957; 1 ♂ and 2 ♀, Lagos, Nigeria, February 2, 1956; 3 ♂ and 1 ♀, Port Gentil, Gabon, Feb. 23, 1956 (all F. Zielinski) (all ZIMH). Also, 1 ♂, Orendo, nr. Libreville, French Equatorial Africa, April 11, 1954; 1 ♀, Pointe Noire, March 10, 1955; 1 ♀, Cabinda, Angola, August 15–20, 1954 (all E. Zielinski) (ZIMH). One ♂ and 1 ♀, Principe Island, September 25, 1949 (G. R. Gradwell and D. Snow).

Diagnosis.—Except for the pale crown, males of *C. medleri* are indistinguishable from males of *C. spectra*. The females, in addition to the pale crown, have a distinctive abdominal sternum VII.

### *Cofana sotoi* Young, NEW SPECIES

Description.—Length of male 6.8 mm, of female 7.6–7.9 mm.

Head moderately produced, median length of crown from slightly less than  $\frac{6}{10}$  to  $\frac{3}{4}$  interocular width and from  $\frac{4}{10}$  to slightly more than  $\frac{4}{10}$  transocular width, anterior margin narrowly rounded in dorsal view; ocelli aligned with anterior eye angles; crown with a slight median concavity across ocelli; antennal ledges oblique and rectilinear or convex in lateral view; clypeus broadly and slightly convex and granulate medially, muscle impressions distinct, transclypeal suture entire or interrupted medially; profile of clypellus a continuation of contour of clypeus.

Pronotum with width approximately equal to transocular width of head, dorsopleural carinae complete or not, posterior portion of disk transversely rugulose, scutellum weakly transversely rugulose or not; forewing with veins fuscous, anteapical cells closed basally.

Female abdominal sternum gradually narrowed to truncate apex, which is slightly convex. Crown, pronotum and scutellum pale greenish-yellow, crown with a median black spot before the ocelli; face with a median basal pale spot, a black spot adjoining each antennal ledge, remainder pale greenish yellow except arcs on areas of muscle impressions, a longitudinal line on each side of median area on clypeus, and median area of clypellus, all pale brown; dorsopleural carina very narrowly dark, remainder of pleural region concolorous with face; metathoracic legs with bases of tibial setae of row 3 dark, remainder of legs pale.

Material Examined.—Holotype and three additional ♀ and 1 ♂, "Rukupr.," Sierra Leone, December 18, 1975 (P. E. B. Soto), on rice (Institute for Agricultural Research, Samaru, Nigeria).

Diagnosis.—*Cofana sotoi* is close to *C. polaris* from which it may be separated readily by the characters used in the key.

Etymology.—The species is named for the collector of the type-series.

#### ACKNOWLEDGMENTS

I am grateful to the curatorial personnel of the institutions listed in the introduction for their ever generous cooperation in lending specimens, and to most of them for courtesies extended during my visit to their institutions in 1962–3.

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